

White Paper

Datacenters Leverage HPE SimpliVity to Drive Operational Simplicity, Improved Performance, and Other Critical Datacenter Benefits

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IN THIS WHITE PAPER

This IDC white paper reviews important market trends that have driven a dramatic increase in real-world hyperconverged infrastructure (HCI) deployments. This white paper also provides the results of in-depth interviews and a global IDC survey of Hewlett Packard Enterprise (HPE) SimpliVity customers, many of which have experienced considerable operational efficiency gains from the use of HPE SimpliVity hyperconverged infrastructure.

SITUATION OVERVIEW

IT departments have long leveraged new infrastructure enhancements to improve core datacenter metrics such as performance, utilization rates, or levels of resiliency. Indeed, decades of compounded technological advances that can be tied back to Moore's law, multicore processors, server virtualization, or storage efficiency (e.g., tiering, thin provisioning, deduplication, and compression) have driven unprecedented levels of availability, performance, and density throughout the datacenter. While such improvements are clearly beneficial, they have tended to result in greater efficiency gains within capex than within opex. This is partly due to the fact that while the vast majority of datacenters are now highly virtualized, few IT departments manage their datacenter infrastructure any differently than they did 10 years ago. Indeed, datacenters and IT departments remain structured in a way that leaves them reliant on inefficient (and expensive) silos of specialists and infrastructure.

This long-term trend of capex improvements outpacing improvements associated with opex has resulted in an ever-increasing gap between the amount spent to buy datacenter infrastructure and the amount spent to manage, power, and cool this infrastructure. Using servers as an example, IDC estimated that every \$1 spent on a physical server in 1995 resulted in just \$0.5 spent to power, cool, and manage that server. The amount of money spent to power, cool, and manage a server has continuously outpaced the actual cost of buying the server over the past 20 years. This capex-opex ratio flipped in favor of opex by 2005. Today, every \$1 spent on a server results in nearly \$4 of spending on power, cooling, and managing a server.

Not surprisingly, the rapid growth of spending on operational expenses has become untenable and has driven many companies around the world to rethink long-standing practices associated with the procurement and management of datacenter assets. Organizations actively addressing operational costs are focusing on reducing (or eliminating) their reliance on inflexible silos of datacenter infrastructure managed by silos of specialists. There are countless events that can trigger a company

to begin such transformations, including deployment of new applications, private cloud initiatives, and technology refresh. One common event has been related to a global drive to incorporate 3rd Platform applications (which can be grouped into four broad categories of social, mobile, cloud, and analytics) into the company's portfolio of workloads. 3rd Platform applications require new levels of scale, automation, and agility that do not align well with the practice of independently buying and managing discrete datacenter resources.

Enter Converged and Hyperconverged Systems

It's been more than five years since organizations began looking into converged systems to help deal with these important and often-transformational datacenter changes. While the architecture of the converged system has advanced over the years, its goal remains very similar. Specifically, converged systems provide a tight integration between core datacenter infrastructure (storage, compute, and networking) while offering centralized management and increased levels of automation.

Broadly speaking, the first generation of converged systems represent a consolidation of disparate datacenter technologies that can be acquired, deployed, managed, and supported as though they were a single system. Fundamentally, these systems are differentiated from traditional hardware platforms and architectures in that they are designed to be deployed quickly using a modular building-block approach to rapidly scale up resources and workloads. While these first-generation converged systems are driving vast amounts of waste out of the datacenter, most systems have been built with the same type of infrastructure that required silos of experts. Further, the average selling prices of these systems tend to make them more suitable for companies with larger datacenter budgets.

The relatively recent emergence of hyperconverged systems, which IDC considers a new generation of converged systems, is helping deliver many of the proven benefits of early converged systems (e.g., reducing complexity and inefficiency), but through a clustered, scale-out architecture that is built on x86-based servers. Hyperconverged systems leverage software-defined storage to provide enterprise storage services through the same x86 server resources that were also used to run hypervisors and applications. These systems eliminate shared, networked storage systems, thus further converging storage and compute resources. In addition to integrating storage and compute functions into a single node (or a cluster of nodes, each offering compute and storage functions), all hyperconverged systems employ:

- A distributed file system or an object store that serves as the data organization, management, and access platform
- A hypervisor that provides workload adjacency, management, and containerization in addition to providing the hardware abstraction layer (with the hypervisor also hosting essential management software needed to manage the platform)
- An (optional) Ethernet switch to provide scale-out and/or high-availability capabilities

Some hyperconverged systems also offer switching and/or networking to bridge the compute and storage layers together and offer other data services (e.g., data efficiency and data protection) to further consolidate and simplify infrastructure elements in the datacenter.

HPE Overview

HPE is a technology company with a comprehensive portfolio ranging from cloud to the datacenter to workplace applications. HPE technology and services help customers around the world make IT more efficient, more productive, and more secure.

Early in 2017, HPE acquired SimpliVity, and it now offers HPE SimpliVity hyperconverged systems, complete hardware and software solutions that are designed, built, and supported by HPE. The turnkey hyperconverged infrastructure platforms are made up of HPE SimpliVity software on HPE's ProLiant DL380 and Apollo 2600 compute platforms. Customer interviews and the survey referenced in this white paper were conducted with customers that have both HPE SimpliVity systems and legacy SimpliVity systems in their datacenter.

The HPE SimpliVity hyperconverged technology enables organizations to simplify IT. Clustering multiple infrastructure units forms a shared resource pool and delivers high availability, mobility, and efficient scaling of performance and capacity.

The HPE SimpliVity hyperconverged infrastructure combines compute, storage services, and network platform in addition to traditional IT functions, including WAN optimization, unified global virtual machine (VM)-centric management, data protection, cloud integration, primary storage deduplication, backup deduplication, caching, and global scale-out:

- **Data efficiency.** Fine-grained deduplication and compression are conducted on all data, in real time and always at the point data is created. This is done to ensure that the data remains deduplicated and compressed throughout its life cycle. All HPE SimpliVity systems are globally aware of the compressed and deduplicated data – whether that data is in multiple systems, datacenters, geographies, or public clouds running HPE SimpliVity's software stack.
- **WAN optimization.** WAN optimization ensures that data transferred between sites or from a site to the cloud is moved in an efficient manner (this is especially helpful in ROBO scenarios or in situations with poor link latencies).
- **Enhanced data protection.** Built-in data protection includes tunable recovery point objectives (RPO) on a per-VM basis, enabling automated, high-frequency backup and replication of VMs to any HPE SimpliVity hyperconverged infrastructure node in a federation. The federation is a collection of nodes managed across multiple sites through a single administrative interface and common APIs.
- **Global scale-out.** As HPE SimpliVity systems can be added simply and efficiently in local or remote datacenters, they instantly become members of the global federation.
- **Unified global management.** HPE SimpliVity systems' resources, policies, and workloads are managed via VMware vCenter, facilitating movement of data and VMs across HPE SimpliVity hyperconverged infrastructure units and datacenters without a need to configure IP addresses, controllers, LUNs, and so forth.
- **VM centricity.** The HPE SimpliVity system is designed around the logical unit of a VM. This means that all management, policies, commands, and information are provided on a per-VM basis. In addition, when a backup is performed for a VM, it does not include the other VMs that share a given data store.
- **Caching and tiering.** To accelerate read performance and assist with read spikes and other I/O bursts, HPE uses caching and tiering.
- **Openness to existing legacy servers.** Non-hyperconverged systems running VMs can be connected to hyperconverged nodes and resident VMs in the federation as a means for using the shared storage resources and services and/or enabling the simple migration of data and VMs from existing servers to the federation.
- **The HPE OmniStack Accelerator card.** This PCIe module is responsible for all intensive algorithm processing in each HPE SimpliVity 380 hyperconverged infrastructure node and ensures that the deduplication and compression can run in real time with no impact on

performance. HPE also offers a software-optimized version of the HPE SimpliVity solution for space-constrained environments.

The HPE SimpliVity Data Virtualization Platform is the underlying technology within these hyperconverged infrastructure systems – an assimilated IT infrastructure platform solution that can run on dedicated hardware and on private, public, and hybrid clouds. The HPE SimpliVity Data Virtualization Platform includes a data architecture in which data is deduplicated and compressed at inception in very small data elements in a globally coherent manner – across nodes, datacenters, geographies, and clouds.

INSIGHTS INTO CURRENT HPE SIMPLIVITY CUSTOMERS

The sections that follow provide insights into a sample of HPE SimpliVity customers. This information comes from two sources:

- **An IDC web survey of 83 end users that have purchased and deployed HPE SimpliVity solutions.** Survey results were completed during the second quarter of 2018 by companies located in all major regions around the world. North America accounted for 55% of the respondents, followed by 39% in EMEA and 9% in Asia/Pacific.
- **In-depth phone interviews with three HPE customers that are currently running HPE SimpliVity solutions in production environments.** Each interview was one hour long and was conducted by IDC during the second quarter of 2018.

Survey Results

Figure 1 provides an indication of how broadly HPE SimpliVity hyperconverged solutions are used within survey respondents' production workloads. On average, respondents (i.e., HPE SimpliVity customers) are currently running 71% of their production workloads on HPE SimpliVity systems. This is up from 59% of their production workloads running on HPE SimpliVity systems just 12 months prior. A look at company sizes tells us that respondents with fewer employees currently run a much larger share of production workloads than their larger counterparts. On average, respondents with fewer than 500 employees currently leverage HPE SimpliVity systems for 81% of their production workloads, whereas respondents with 500+ employees run 64% of production workloads on HPE SimpliVity systems. The average share of customer production workloads on HPE SimpliVity systems is expected to increase again over the next 12 months, but at a more moderate rate (76% of total).

FIGURE 1

Share of Total Production Workloads Running on HPE SimpliVity

Q. Please estimate the percentage of your organization's total production workloads running on HPE SimpliVity hyperconverged infrastructure 12 months ago, today, and 12 months from now.



n = 83

Source: IDC, 2018

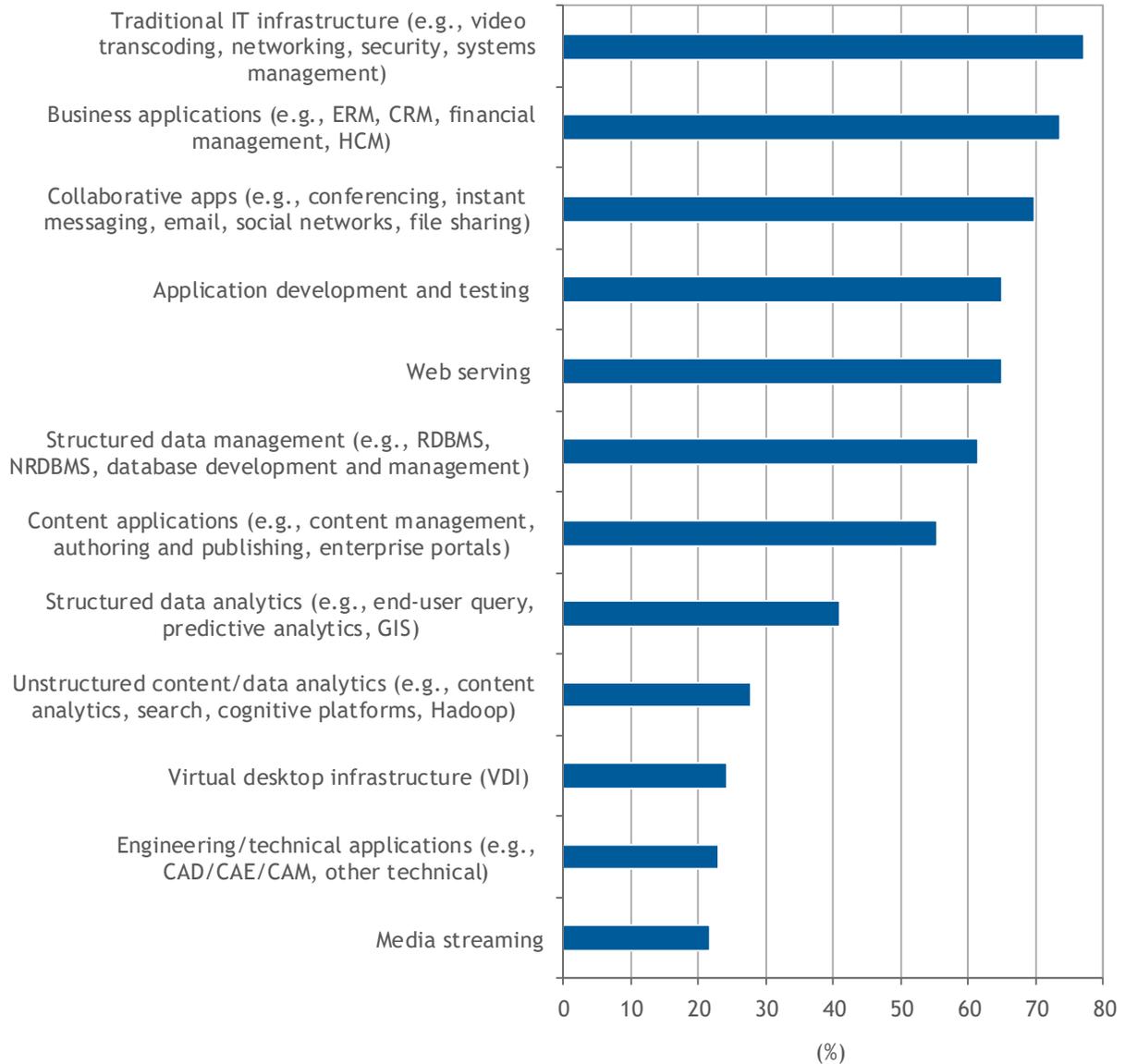
Figure 2 offers insight into the types of workloads currently running on HPE SimpliVity systems. The most common workload type was traditional IT infrastructure (i.e., file/print, systems management, network management, and security), followed by business applications (e.g., ERP, CRM, financial management software) and collaborative applications. These workloads were followed by application development and testing and web serving, which also returned similar shares of total responses.

These rankings resemble past IDC surveys that have explored the types of existing applications running on hyperconverged systems; results of these surveys tend to place IT infrastructure, application/software development, and collaborative applications among the most common workloads.

FIGURE 2

Workloads Running on HPE SimpliVity, 2018

Q. Which of the following workloads in your environment today are deployed on HPE SimpliVity hyperconverged infrastructure?



n = 83 (total responses = 505)

Source: IDC, 2018

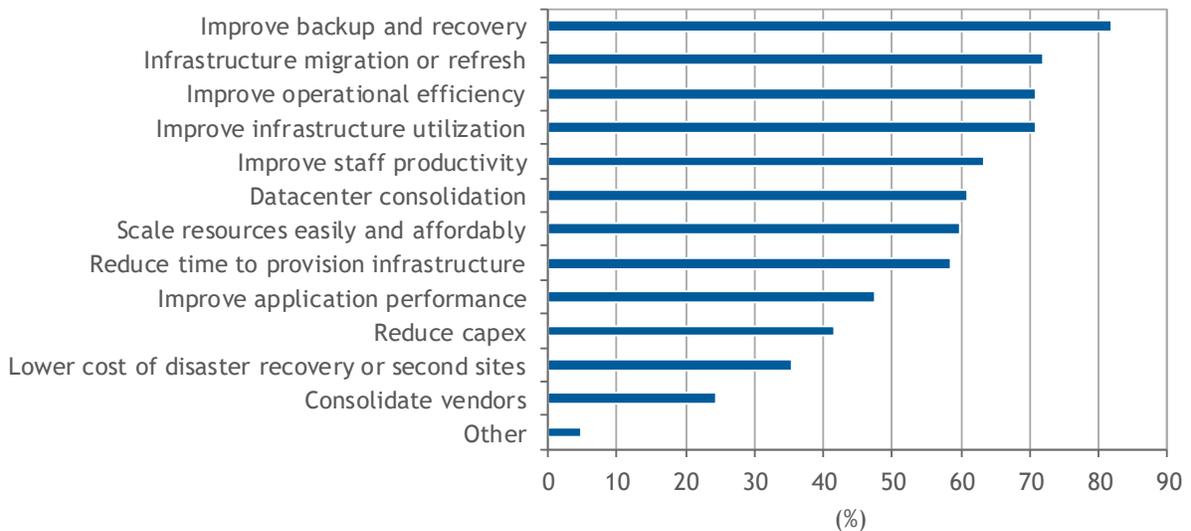
Figures 3 and 4 explore the challenges respondents sought to address when deploying HPE SimpliVity. The figures list the "primary" challenges as well as "all challenges" respondents were looking to address when deploying HPE SimpliVity. The results for primary challenges reflect just one choice per respondent, whereas the results for all challenges reflect multiple responses. The primary

challenge HPE SimpliVity customers were looking to address was infrastructure migration and/or technology refresh. This challenge represented 28.9% of all respondents, which was more than double the second most common primary challenge of improving backup and recovery (12%). Although called out explicitly in this survey, it should be noted that other choices reflected here are often tied to gains in operational efficiency. One response that stands out among all others for "all challenges" is "improving backup and recovery," which was listed as a challenge by 82% of all respondents. While improving backup and recovery may not be the most common "primary" challenge companies are turning to HPE SimpliVity infrastructure to help solve, it is clear that the vast majority view it as a valued feature.

FIGURE 3

All Challenges Addressed with HPE SimpliVity Deployment

Q. What is the challenge that your organization sought to address with the use of a HPE SimpliVity hyperconverged infrastructure?



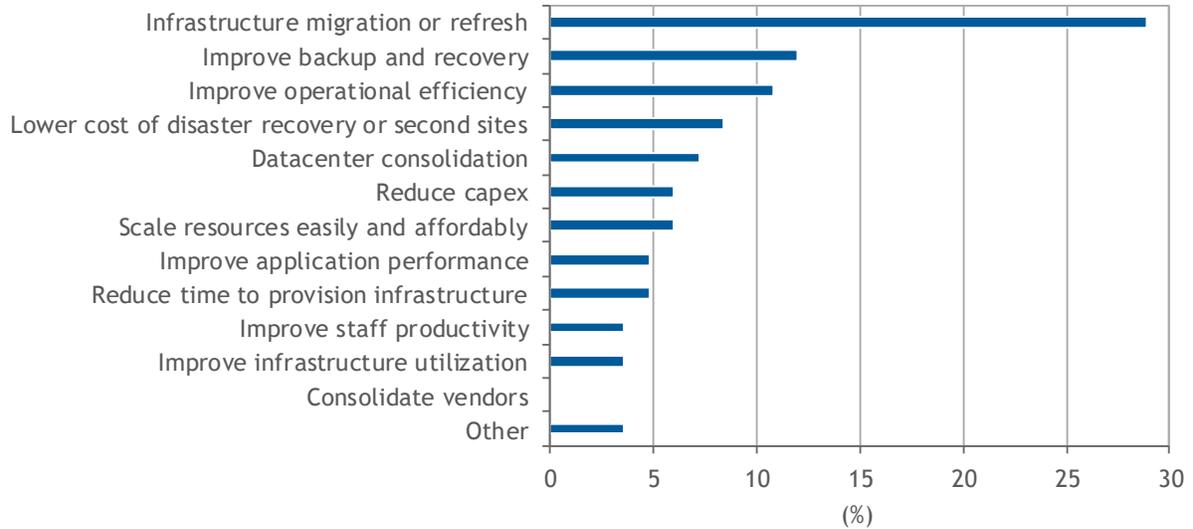
n = 83 (total responses = 567)

Source: IDC, 2018

FIGURE 4

Primary Challenge Addressed with HPE SimpliVity Deployment

Q. What is the primary challenge that your organization sought to address with the use of a HPE SimpliVity hyperconverged infrastructure?



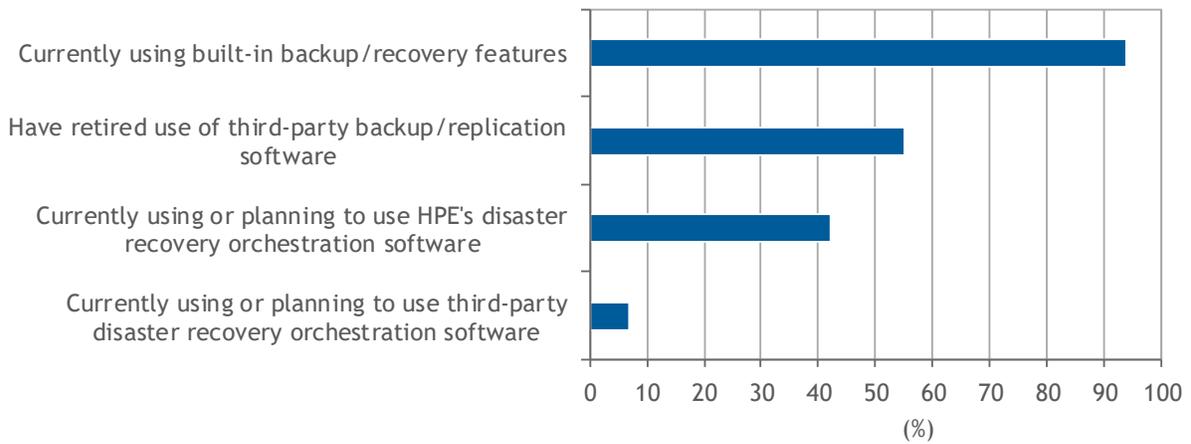
n = 83 (total responses = 83)

Source: IDC, 2018

Figure 5 dives deeper into the use of HPE SimpliVity data protection features and their impact on existing, established offerings. 94% of the surveyed customers are currently using the built-in data protection features. The impact of HPE SimpliVity data protection features frequently results in reduced use of existing data protection software. Indeed, 55% of survey respondents retired their existing third-party backup or replication software in lieu of HPE SimpliVity data protection features.

FIGURE 5

Data Protection and Disaster Recovery Within HPE SimpliVity Environments



n = 83

Source: IDC, 2018

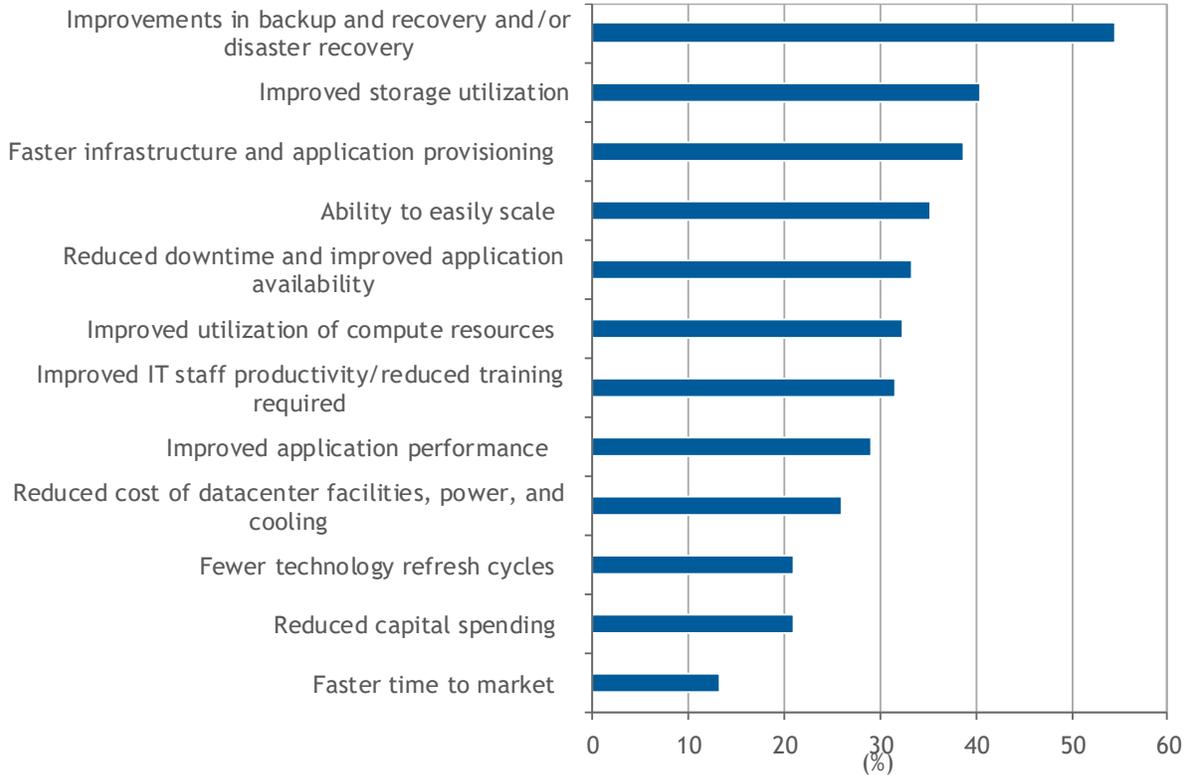
Areas of Realized Improvements

This section reviews the improvements realized from the deployment of HPE SimpliVity infrastructure. Rates of improvements are quite high for all the areas listed. The biggest rate of improvement occurred within backup and recovery or disaster recovery (DR) environments (see Figure 6). Survey respondents tell us that, on average, HPE SimpliVity improved their backup or DR environments by 55% when compared with their previous environment. This is likely tied to the HPE SimpliVity platform's simplified approach to backup and recovery and disaster recovery, the platform's ability to meet stringent recovery point and recovery time objectives, and a reduction in the use of third-party software. It's also likely tied to global deduplication and replication features, which have allowed many customers to implement disaster recovery more cost efficiently than prior solutions. This area was closely followed by improved storage utilization (40.4% improvement), which is likely due to HPE SimpliVity's global deduplication and compression technology. Other noteworthy customer improvements include IT and application provisioning times (38.7%) and improved application performance (29%).

FIGURE 6

Average Improvements Driven by HPE SimpliVity

Q. *What percentage improvement has your organization experienced from the use of HPE SimpliVity hyperconverged infrastructure in any of these areas?*



n = 83 (total responses = 314)

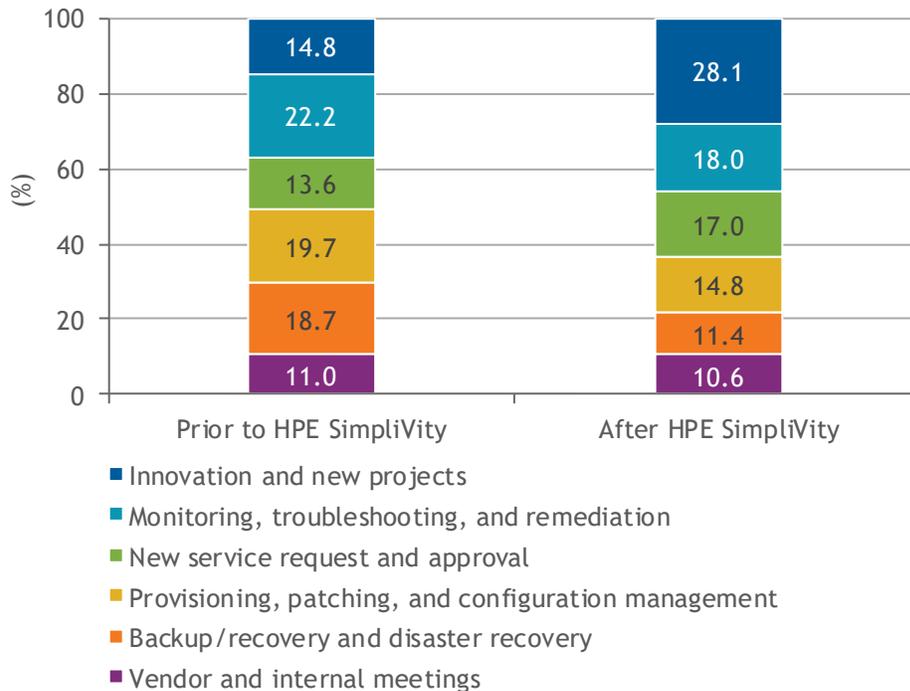
Source: IDC, 2018

Figure 7 provides the results from the portion of the survey that asked respondents to allocate how much time IT staff tend to spend on typical projects or tasks. The results represent a "before and after" view for HPE SimpliVity customers. The most striking change comes within the highly coveted time spent on innovation and new projects. HPE SimpliVity customers spent 14.8% of their time on innovation and new projects before deploying HPE SimpliVity compared with 28.1% of their time on innovation and new projects after deploying HPE SimpliVity, a gain of 91%. Broadly speaking, this was made possible from time savings associated with managing fewer infrastructure components to support respondents' virtualized workloads, simplified backup/recovery and disaster recovery (an improvement of 39%), and less time spent troubleshooting. In addition, respondents reported seeing a 25% improvement in time spent provisioning, patching, and configuration management and a 19% improvement in monitoring, troubleshooting, and remediation. It should be noted that these results were compiled prior to HPE's acquisition of software-defined networking (SDN) company, Plexxi. It is reasonable to expect this acquisition to, in time, lead to the integration of Plexxi's SDN capabilities into an HPE SimpliVity hyperconverged solution. Such a solution could take these powerful results even further by removing the cost and complexities associated with datacenter networks.

FIGURE 7

Impact of HPE SimpliVity on Time Spent on Select Tasks

Q. Considering the following mix of tasks, over a given week, what percentage of total IT administrator/operations staff time is spent on the following six tasks before and after HPE SimpliVity was deployed?



n = 83

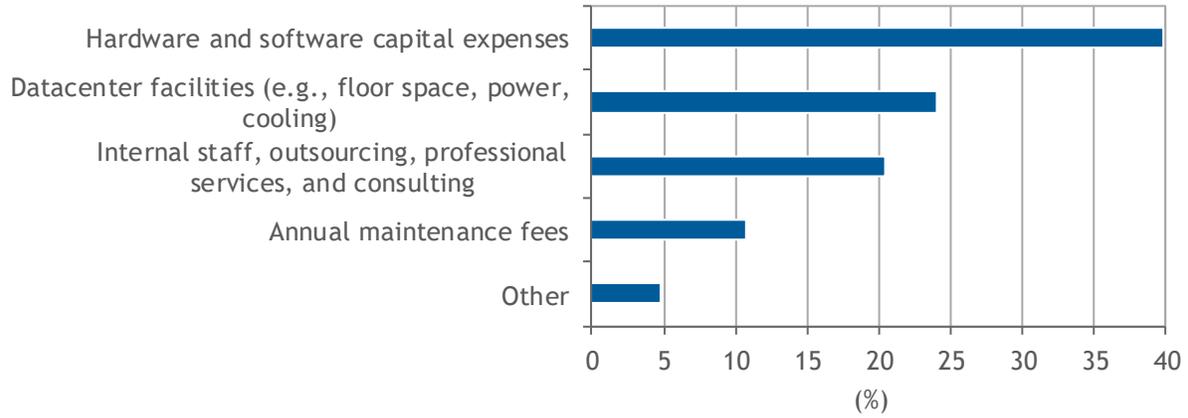
Source: IDC, 2018

Figure 8 identifies where survey respondents achieve budget savings by deploying the HPE SimpliVity platform. Hardware and software capital expenses were the most common source of budget savings (39.8%), with costs related to datacenter facilities (e.g., power, cooling, datacenter floor space) surfacing as the second most common source of budget savings (24.1%). Figure 9 reveals that HPE SimpliVity customers were able to shift investments toward new technology projects and purchases from 48% to 59% of their IT budget. This represents a 23% increase over their pre-HPE SimpliVity environments.

FIGURE 8

Source of Savings Driven by HPE SimpliVity

Q. On which of the following budget line items have you achieved savings by deploying HPE SimpliVity hyperconverged infrastructure?



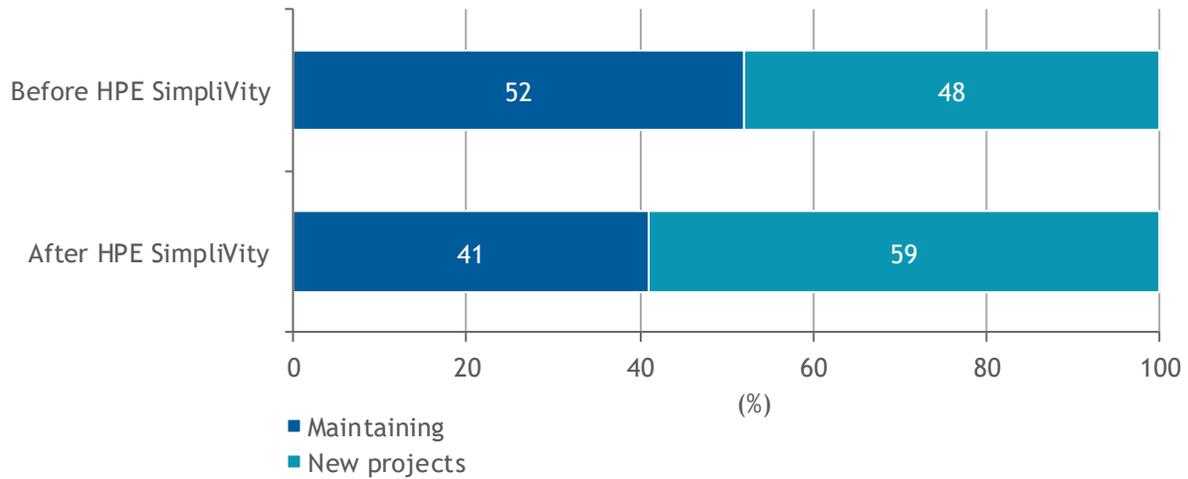
n = 83

Source: IDC, 2018

FIGURE 9

IT Budget Spending on New Projects Versus Maintaining Existing Infrastructure: Before and After Deployment of HPE SimpliVity

Q. Approximately what percentage of your organization's IT budget will be spent on new technology projects and purchases, as opposed to the percentage of budget spent on maintaining existing infrastructure?



n = 83

Source: IDC, 2018

Highlights from In-Depth Interviews with Three HPE SimpliVity Customers

As previously noted, IDC interviewed three HPE SimpliVity customers to better understand how they use the technology and how they are benefiting from HPE SimpliVity solutions.

Interview 1: A Hospitality Company Operating More than 10 Seasonal Resorts in North America

IDC interviewed a company in the hospitality industry that primarily operates more than 10 seasonal resorts. The company has an IT staff of nearly 100 people that are complemented by 40 external IT professionals. The company owns 150 servers (70% of which are virtualized) that are located in multiple datacenters. The company runs industry-specific workloads that support operations and sales. In total, the company runs 25 business applications that include on-premise software and SaaS applications.

As an organization that has grown rapidly through acquisition, the company had disparate systems and a datacenter that was nearing end of life. HCI was seen as a way to simplify IT management in the most cost-effective way. The company initially deployed HPE SimpliVity as the foundational infrastructure for its new datacenter. The company initially implemented two nodes of HPE SimpliVity and expanded rapidly from there. It currently runs three SimpliVity clusters for a total of 15 nodes. Two of these clusters are located at its primary datacenter, and the third represents the first cluster deployed at one of its resorts.

The company cites IT simplification and cost-effectiveness as among the primary drivers of HCI. As a company that has grown through acquisition, there were multiple tools for managing infrastructure for activities such as IT ticketing, backup, and system monitoring. Standardizing infrastructure and management tools was one of the benefits that HCI could deliver. The company has subsequently deployed HPE SimpliVity at one of its resorts. The operational simplicity and centralized management allow local IT staff to spend their time supporting local users and site-specific infrastructure (networking, WiFi, resort applications, etc.) rather than spending time on infrastructure-specific tasks such as racking and stacking, managing storage, managing networking, and backups. HPE SimpliVity enables the company to centralize management of SimpliVity clusters. The company intends to roll out additional HCI clusters at each resort as installed servers and storage enter end of life and require refreshing.

The following are highlights that were brought up during the interview, with select quotes from the customer:

- Investment in HPE SimpliVity technology resulted in significant benefits to backup processes and staff efficiency, with time spent on managing infrastructure reduced by 25%.
- "Looking forward, HCI will be the infrastructure used for all resorts and our datacenter."
- "We will soon be at a point where the data in our datacenter will strictly be on SimpliVity."
- "We hardly provision storage anymore."
- "We are trying to phase out existing backup systems. That's the goal ... to drive the backup headaches out and just use SimpliVity ... to take our existing [backup] software into an archive role."

Interview 2: A Nonprofit Biomedical Research Institution

IDC interviewed a nonprofit biomedical research institution that has 20 nodes of HPE SimpliVity systems spread across six locations and seven clusters. The HPE SimpliVity deployment also includes approximately 500 virtual desktops, more than 150 virtual servers, and approximately 200TB of SimpliVity capacity. The organization has approximately 2,000 employees and 100 IT staff members. The company has a large amount of HPC infrastructure, but this conversation focused only on its business applications. The infrastructure supporting its business applications includes 75 servers (of which 99% are virtualized), 1PB of enterprise storage capacity, and 1,400 virtual machines. At the time that IDC conducted the interview, the organization had very limited use of public cloud.

Initially, the organization deployed HPE SimpliVity for a VDI project designed to create a better platform to keep an accurate inventory of lab mice. The goal was to connect the people who care for mice with the ERP system used to track inventory of the mice sold. The organization could potentially lose millions in revenue if the system went down or simply didn't have a way to accurately keep track of valuable inventory.

The organization investigated other HCI offerings and opted to go with HPE SimpliVity because of its high performance and tight integration with VMware vCenter. Importantly, the organization found that competing HCI solutions required changes and continual tuning to address performance, which was needlessly complex and therefore ran contrary to HCI's promise of simplicity.

HPE SimpliVity was also brought in to reduce the latency of the organization's SQL Server environment; SQL Server was moved from a siloed blade and storage infrastructure to the HPE SimpliVity all-flash HCI. The organization was pleased with the results of this migration and the resulting performance. It then deployed HPE SimpliVity for its ERP application, which helped reduce the complexity of the infrastructure supporting critical information such as inventory and greatly improve application performance. The organization is currently running its data warehouse on HPE SimpliVity, which has driven query response time down to just a few minutes. This was instrumental to the development team's successful shift to an agile development workflow.

HPE SimpliVity helped drive down the complexity, risk, and cost related to the organization's data protection environment. It has reduced the time to backup all local data from 7 hours to just 45 minutes. HPE SimpliVity is also deployed in a small cluster at a colocation for low-cost and easy-to-manage disaster recovery. DR remains an ongoing project, but the company stated that HPE SimpliVity has initially reduced complete recovery time from as many as 30 days to just 24 hours. The company has a goal of getting this down to less than an hour using HPE SimpliVity.

The following are highlights that were brought up during the interview, with select quotes from the customer:

- "We are overworked and understaffed, so how can we find a way for the staff to get more done? I see HCI as a way to do that. SimpliVity is driving real operational simplicity."
- Prior to SimpliVity, the system admin team had many specialists. "The team now manages storage, ESXi, network, etc. from vCenter."
- "I can say specifically [HPE SimpliVity allowed developers] to move into an agile workflow and it's allowed them to meet their agile schedules."
- "Our goal is to keep 90 days of backups within SimpliVity. If something needs to be backed up for more than 90 days, we feel that needs to go to an archive tier."

- "We [now] have everything running in SimpliVity. We take a snapshot once a night and we copy that to [our DR site]."

Interview 3: A Provider of Short-Term Insurance Based in South Africa

IDC interviewed a South Africa-based insurance company with approximately \$100 million in annual revenue and more than 750 employees. The IT department has more than 50 full-time employees, of which 70% work in development and 30% are responsible for operations. There are six infrastructure administrators who work on hardware, virtualization, backups, databases, and network security. The company outsources noncore business functions such as desktop support.

The company's infrastructure is located in South Africa and Namibia and includes 18 physical servers. 98% of its servers are virtualized, running approximately 150 virtual machines with 200TB of capacity. HPE SimpliVity is installed at two sites and at a colocation facility. The HPE SimpliVity deployment includes three clusters (made up of nine total nodes) and accounts for all but one of the company's systems. At headquarters, HPE SimpliVity runs production workloads, and the company is currently expanding production use to a third on-premises site in Namibia. The company runs HPE SimpliVity at a colocation for backups. Copies of data are created among all three sites.

The following are highlights that were brought up during the interview:

- HPE SimpliVity reduced the amount of time spent on managing infrastructure:
 - Investment in HPE SimpliVity technology resulted in 40% improvement to the amount of time spent on deploying infrastructure, configuring networking, provisioning storage, managing storage, and scaling resources.
- HPE SimpliVity reduced the complexity of backups and the time spent managing them:
 - The production environment is now backed up every five minutes.
 - It no longer restores from physical copies.
 - Full recovery has been reduced from three days to three hours.
 - The company can now "recover in seconds with just a few clicks."
 - The company once restored a 14TB file system from HPE SimpliVity in 20 seconds.

The company has realized "major performance benefits":

- 50-60% improvement in the development environment
- 30-40% improvement in the production environment
- Biggest performance improvements within the data warehouse, which creates multiple terabytes of data per day

CONCLUSION

Decisions made within IT departments have never been more important to the broader business than they are today. IT departments must react quickly to new business initiatives that are designed to drive bottom-line improvements and generate new revenue streams. The HPE SimpliVity customers surveyed by IDC for this white paper align with this trend. It should be no surprise to learn that IT departments are increasingly looking for infrastructure that improves resource utilization rates while addressing productivity and agility within the datacenter. Organizations around the world have turned to converged systems to achieve just such goals and helped turn converged systems into a rapidly growing market

segment. Hyperconverged offerings like HPE SimpliVity 380 has become the next phase of infrastructure convergence, thanks to their ability to improve upon the realized benefits of first-generation converged systems by redesigning datacenter infrastructure and allowing customers to:

- Collapse silos of storage, compute, and data management services into standard nodes of x86 servers
- Collapse silos of IT experts by allowing customers to leverage common virtualization tools to manage most (if not all) of the infrastructure tasks required to support virtualized workloads
- Reduce the need to deploy many types of dedicated appliances and separately licensable infrastructure within the datacenter, including data efficiency and data protection solutions

Although the market for converged and hyperconverged systems remains relatively young, it is becoming increasingly clear that these scale-out and feature-rich systems are driving real benefits within datacenters around the world, impacting capex and, more importantly, opex.

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